Elbit MILITARY PRODUCTS

SYSTEM 82

WEAPON DELIVERY & NAVIGATION SYSTEM 82

INTRODUCTION

The intensifying deployment of both simple and sophisticated anti-aircraft weapon aiming systems poses an increasing threat to the successful operation of strike and ground attack aircraft against defended targets.

From the operational pilot's point of view, low level operations, while conferring a much lower vulnerability to ground defense, pose increasingly difficult problems in relation to navigation and weapon aiming.

Attacking aircraft must be able to hit their target accurately on their first pass. This cannot be done without some form of assistance from an automated navigation and weapon delivery system.

System 82 is a highly sophisticated, state-of-the-art, IMU-based, digital computerized weapon delivery and navigation system.

The Elbit WDNS enables the pilot to:

- Navigate and arrive at the target on ETA with great accuracy
- Release a vast variety of airborne weapons in "uncanned" paths
- Obtain A/A missile firing envelope information, provided on a Head-Up Display
- Operate "Snap Shoot" and LCOS modes of gun firing
- Launch "smart" weapons
- Enter, before flight, data and control commands
- Operate a highly sophisticated stores management system, for weapon release with maximum efficiency and safety

SYSTEM FEATURES

- 0.6 nm/h navigational accuracy
- 6 mr C.E.P. weapon delivery accuracy
- Easy entry of data and control commands
- Back-up display for A/G and A/A
- Stores Management System
- Rapid warm-up
- 500 h MTBF
- Designed on HOTAS (Hands on Throttle and Stick) principle
- Growth potential in:
  - Computational capability
  - Memory capacity
  - Handling of new kinds of weapons
- Built-in self test
- Enhanced reliability and maintainability
- Modular basis design

MODES OF OPERATION

- Air-to-Air (A/A)
- Air-to-Ground (A/G)
- Navigation (NAV)

MODES OF OPERATION (Cont'd)

A/A MODE

- Missiles
  - The launching envelope is computed, and displayed to the pilot through the HUD
  - Hotline (Snap Shoot)
  - LCOS (Lead Computing Optical Sight) – back-up mode

A/G MODE

- CCIP (Continuously Computed Impact Point)
- DES/TOSS (Designated Toss)
- TOSS
- Direct back-up visual delivery capability
- Special Ordnance – "smart" bombs

NAV MODE

- Computation and display of steering commands for preselected designations
- Up to 40 waypoints

STORES MANAGEMENT SYSTEM (SMS)

The SMS enables pre-flight performance of the activities connected with weapon management and release.

The SMS replaces

- Weapon Selector
- Fuse Selector
- Weapon Data Insertion Panel
- Gun Switch
- Missile Switch
- Missile Cool Switch
- All Store Switches
- Release Program Selectors and Switches
- Jettison Selector

A unique feature of the SMS is the dual mode of operation which ensures maximum safety from accidental release.

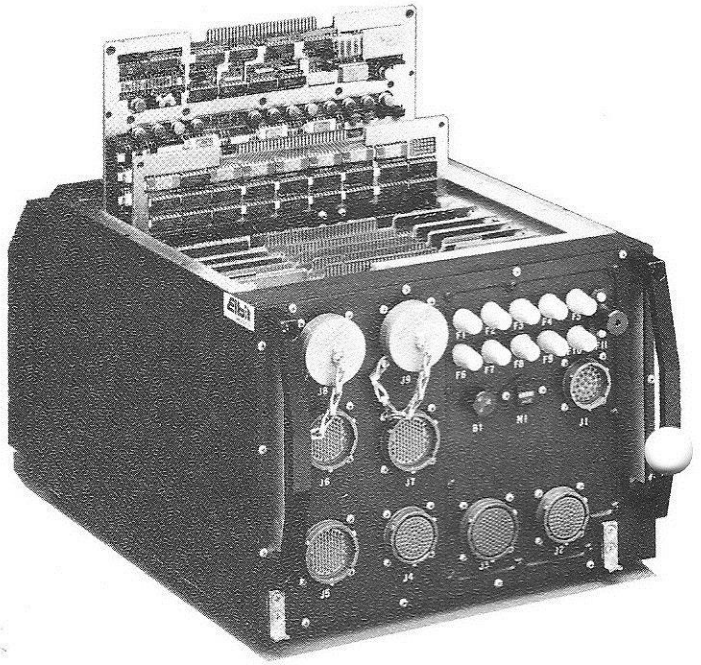
SYSTEM UNITS

CENTRAL COMPUTER

The Central Computer is the main computer for navigation and weapon delivery computations; it generates and controls HUD displays.

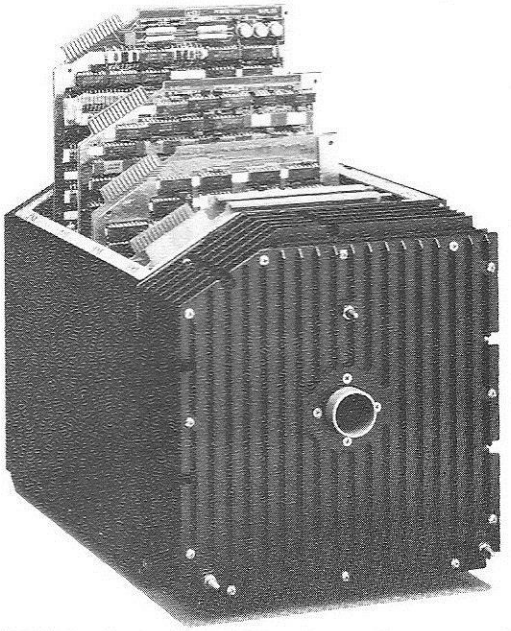
The Computer comprises the following 5 units:

- Central Processing Unit and Program Memory
- Converter Unit
- Symbol Generator
- Core Store
- Power Supply Unit



STORES MANAGEMENT COMPUTER (SMC)

The SMC manages weapon release with maximum efficiency and safety, taking into account the conditioning and limiting factors.

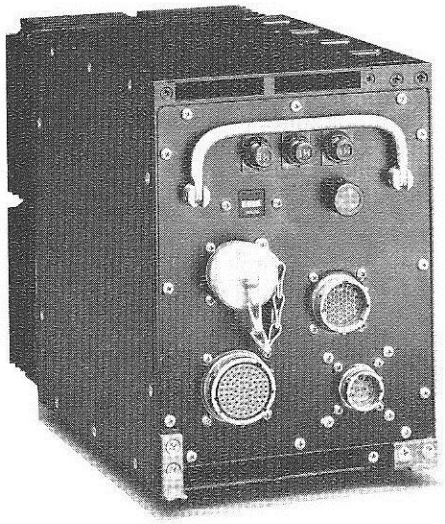


The SMC includes the following units:

- Dual Redundancy
- Symbol Generator
- Common Memory
- Fault Monitor
- Power Supply Unit

BACK-UP COMPUTER (BUC)

The BUC is a back-up to the Central Computer. It calculates and generates the display of LCOS (A/A) Mode and Direct (A/G) Mode.



FEATURES

- Based on a 8086 microprocessor unit
- Independent symbol generator
- EPROM memory
- Converter unit
- Automatic fault detection

CONTROL TERMINAL UNIT (CTU)

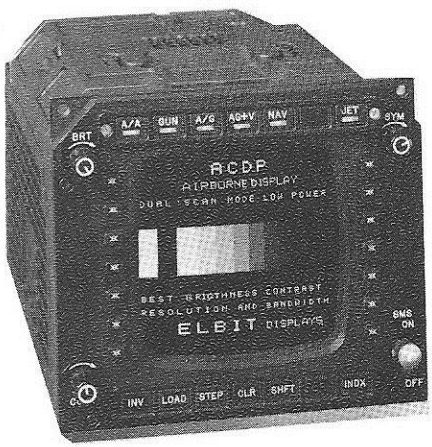
The CTU is used for entry of data into and extraction of data out of the Central Computer. It controls system alignment, operation, test and selection of navigation sub-modes.

FEATURES

- Design based on operational experience
- Legible readout

ARMAMENT CONTROL AND DISPLAY PANEL (ACDP)

The ACDP is controlled by both pilot and SMC.



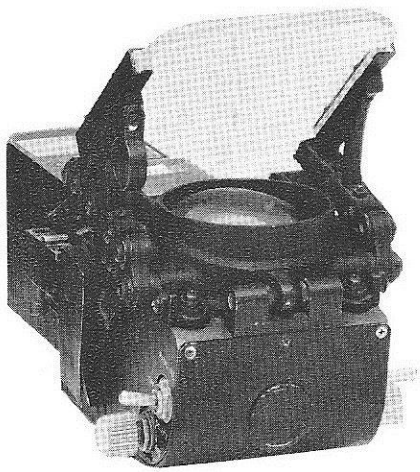
The ACDP displays on a TV screen

- Continuously updated weapon inventory
- Video from sources (sensors, weapons)
- Selected release program parameters
- Warnings in case of erroneous programming

HEAD-UP DISPLAY

The HUD

- Provides the pilot with all relevant operational information
- Utilizes a minimum number of signals, to avoid confusion
- Is designed so as not to interfere with the pilot's normal viewing
- Provides warning information symbology



TECHNICAL DATA

Central Computer

Computer:
- Memory word length . . . . . 16 bits
- Registers . . . . . Seventeen 32-bit registers (for Arithmetic Unit); Seven 16-bit registers
- Commands . . . . . Wide range, including multiplication and division; fixed and floating point
- Addresses . . . . Absolute; immediate; relative; indexed; indirect; stack

Memory:
- EPROM . . . . . 48K x 16 bits
- RAM . . . . . 6K x 17 bits
- Non-volatile RAM . . . . . 2K x 17 bits

Converter:
- A/D . . . . . 24 tracks
- D/A . . . . . 8 tracks
- S/D . . . . . 6 tracks
- D/S . . . . . 3 tracks
- Synchro buffers . . . . . 2 tracks
- Input discrete . . . . . 48 tracks
- Output discrete . . . . . 24 tracks

Symbol Generator . . . . . Straight lines, scales, digits, letters, circles 3000 mr/20 ms

Core Store 16K

Input Power . . . . . 115V, 3Ø, 400Hz 28V DC

Power Consumption 200VA

Environmental Conditions . . As per MIL-E-5400, Class IIX

Dimensions . . . . . 273 x 382 x 195 mm

Weight . . . . . 20 kg

Stores Management Computer

Redundancy . . . . . One of two independent computing systems, providing full redundancy

Dual Power Supply

Memory:
- EPROM 58K
- RAM 3K
- Non-volatile RAM 1K

(Cont'd)

I/O:
- Inputs . . . . . 160 discrete
- Outputs . . . . . 120 discrete

Real-Time Clock 1kHz

Input Power . . . . . 28V DC

Power Consumption 80VA

Environmental Conditions . . As per MIL-E-5400, Class IIX

Dimensions . . . . . 321 x 194 x 172 mm

Weight . . . . . 13.5 kg

Armament Control & Display Panel

Scanning . . . . . 525 or 875 lines

Bandwidth . . . . . 20 MHz

Contrast Ratio 7:1

Input Power 28VDC; 115VAC, 1Ø, 400Hz

Power Consumption 80VA

Environmental Conditions . . As per MIL-E-5400, Class I

Dimensions . . . . . 172 x 147 x 267 mm

Weight . . . . . 7 kg

Back-Up Computer

Based on 8086 microprocessor unit

Memory:
- EPROM 16K
- RAM 1K

Inputs . . . . . 8 analog; 4 synchro; 10 discrete

Independent Power Supply

Symbol Generator . . . . . 2300 mr/20 ms

Input Power 115V, 3Ø, 400Hz

Power Consumption 80VA

Environmental Conditions . . As per MIL-E-5400, Class I

Dimensions . . . . . 241 x 194 x 140 mm

Weight . . . . . 9 kg

TECHNICAL DATA (Cont'd)

Control Terminal Unit

Serial Interface to Main Computer .... 1 Mbit/s (grouped in 16-bit words)

Input Power ..... 5VDC at 2A
115VAC, 400Hz at 0.1A

Environmental Conditions. . As per MIL-E-5400, Class I

Dimensions ..... 175 x 167 x 127 mm

Weight..... 2.5 kg

GROWTH POTENTIAL

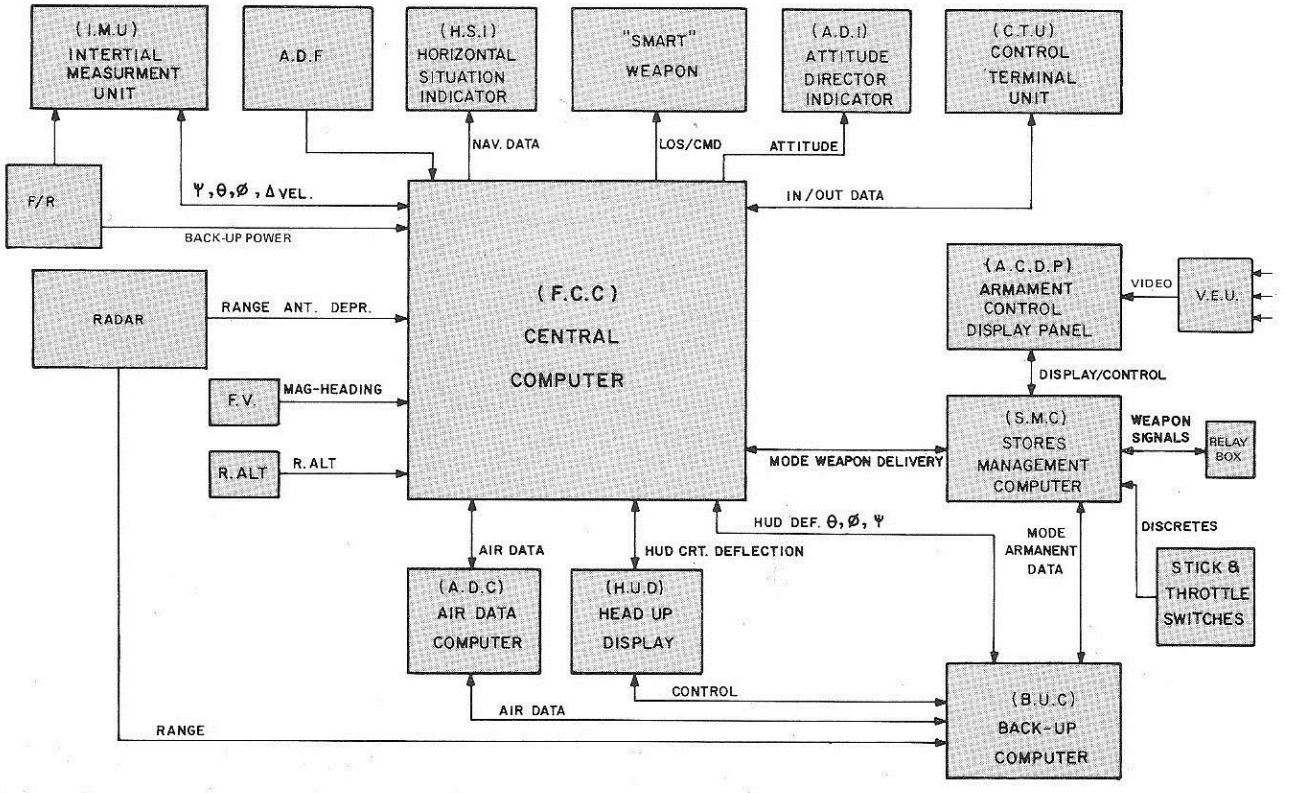
- Computational capability (40% spare computation time)
- Memory expansion capacity
- Handling of new kinds of weapons

ELBIT QUALIFICATIONS

- 10 years experience in avionics design, development and production (hardware and software)
- Equipment on A-4, F-4 and Kfir aircraft
- Design based on operational experience

The greatest care and skill, together with combat experience, assure quality and reliability.

System 82 – Simplified Block Diagram



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